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(71) Applicant(s)

G E Baker (UK) Limited

(Incorporated in the United Kingdom)

Heath Road, Woolpit, Bury St Edmunds, Suffolk,
IP30 9RN, United Kingdom

(72) Inventor(s)

Mark A Harding

Glyn E Baker

(74) Agent and/or Address for Service

G E Baker (UK) Limited

Heath Road, Woolpit, Bury St Edmunds, Suffolk,
IP30 9RN, United Kingdom

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(56) Documents Cited
US 5063880 A US 5056467 A US 4987861 A
US 4580529 A

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(54) Animal actuated cooling spray

(57) An animal actuated cooling spray 16 is initiated by a sprung nudge late 12. A adjustable time ON valve 19 operates for 1 to 15 seconds.

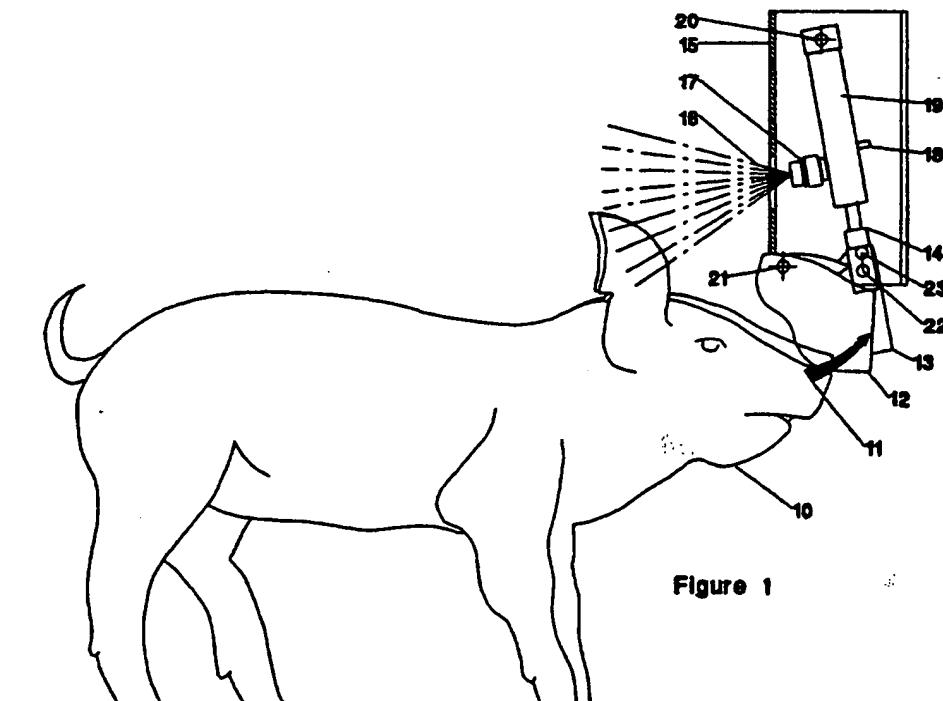
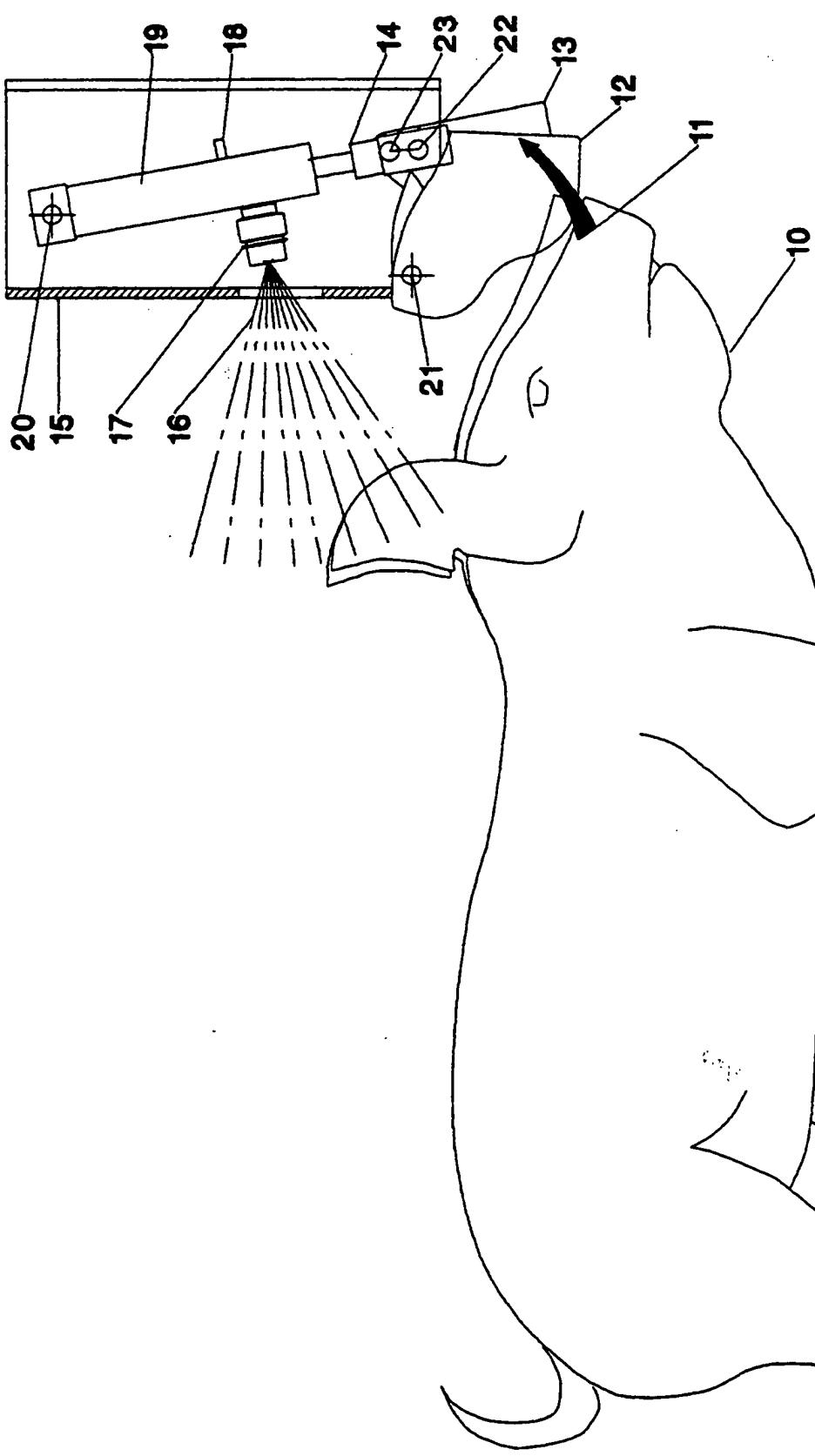


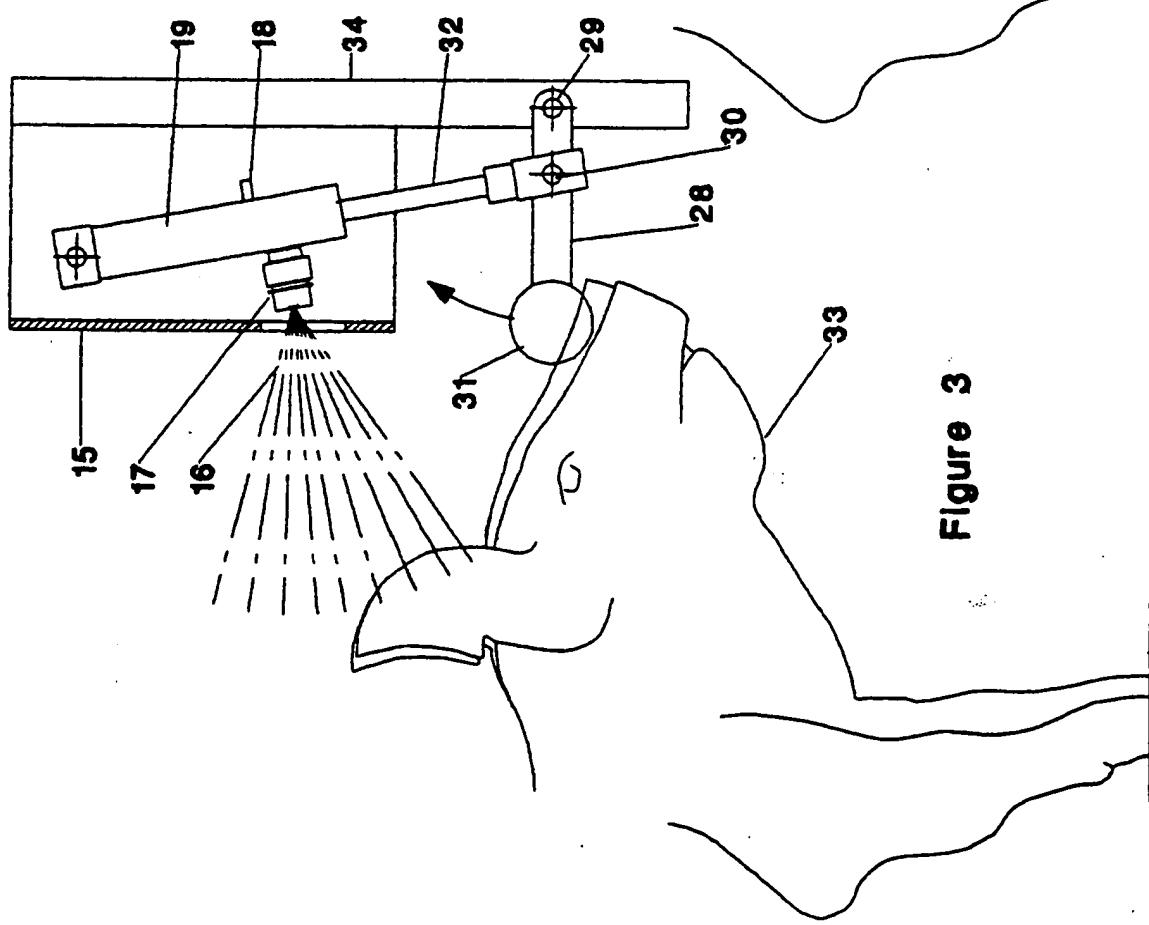
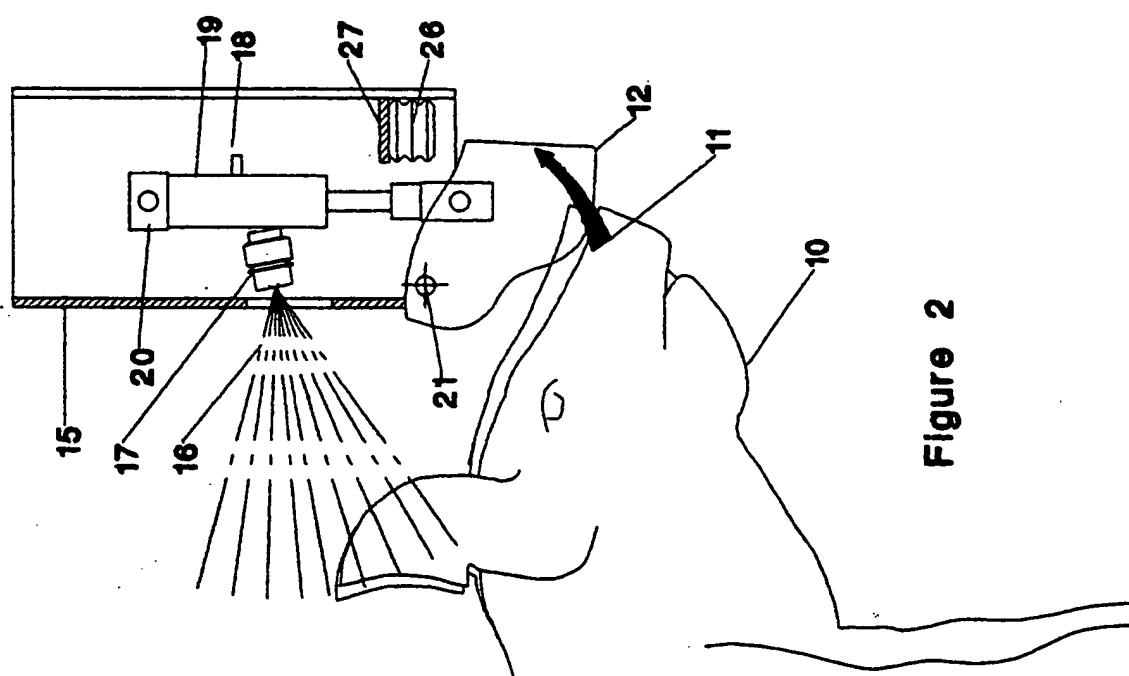
Figure 1

GB 2 313 032

Figure 1



2/2



A SELF OPERATED COOLING DEVICE

This invention relates to a self operated cooling device particularly useful for livestock animals utilising a valve with on time delay features and with provision made to absorb the shock load placed on it when actuated.

In hot weather, the well being of livestock is affected by the heat, the result being appetite suppression and a reduction in fertility and lower conception rates. Misting systems are installed in livestock buildings which are controlled by an electronic timer or thermostat to deliver a cooling water mist over the entire building.

Livestock however, are capable of adopting behaviour to utilise their environment to choose to cool themselves where the facility is available. This may be by using a wallow or lying in a shaded area or in a breeze. Livestock are also capable of operating devices to actuate mechanisms such as in drinkers or feed dispensers.

Misting systems do not provide livestock with the opportunity to cool themselves when they choose to do so.

A device is known whereby the livestock animal may operate a nudge bar which by means of a mechanical linkage opens a valve, this valve may typically be a ball valve. Consequently when the animal lifts the nudge bar, the valve is opened and when the animal lets go of the nudge bar the valve closes immediately.

Livestock animals strength increases significantly with their weight and so the known device must withstand shock loads up to and over 2000 Newtons applied to the mechanism and valve. In the known device there is no shock absorbent device employed to limit the effect of these potential forces. The device relies only upon the structural strength to resist damage by large loadings.

According to the present invention there is provided a self operated cooling device particularly useful for livestock animals comprising a nudge plate for activation by an animal in connection with a valve which has a time on delay feature for spraying a misting jet of cooling liquid over the animal for a period of time after actuation. These components are fixed to a mounting chassis or bracket for fixing to a supporting structure. The bracket or chassis may enclose and support the components such that the animal can actuate the nudge plate with a single stroke and release the valve immediately, this causes the valve to open and spray a

misting jet of cooling liquid for a period of time in the region of 1 to 15 seconds or more governed by the design of the valve components. The valve thereby delivers a spray of water through a nozzle over the animal to cool it. A device is also used for absorbing the shock of the actuation force applied to the nudge plate by the animal.

Specific embodiments of the invention will now be described by way of example with reference to the accompanying drawings in which:

Figure 1 shows a layout of the device and the main components relative to an animal where the valve and shock absorber are integrated into one assembly;

Figure 2 shows an alternative layout of the arrangement shown in Figure 1 with separate valve and shock absorber.

Figure 3 shows an alternative layout of a nudge bar.

Referring to the drawing in Figure 1 the self operated cooling device comprises a nudge plate 12 pivoted on a mounting chassis 15 and connected to a valve 19 which when actuated opens and then delays closing for a period of time in the region of 1 to 15 seconds to create a misting spray 16 through a nozzle 17 of cooling liquid from a supply connected to the tube 18, the valve also incorporates a shock absorbing device and is fixed to the mounting chassis 15.

In order to operate the cooling device, a livestock animal 10 for example nudges the nudge plate 12 moving it in the direction 11 to position 13, this in turn moves the plunger 14 into the valve assembly 19 integrating the shock absorber. The mechanism within the valve opens to allow cooling liquid to pass through the valve and create a misting spray through the nozzle 17 in the direction of the livestock animal 10. The misting spray continues to form after the livestock animal 10 has released the nudge plate 12 by means of a mechanism within the valve assembly 19, the delay ceasing the flow of liquid and the misting spray is for a period of between 1 and 15 seconds.

Referring to the drawing in Figure 2 an alternative layout for a self operated cooling device is shown whereby the delay valve 24 and shock absorbing device 26 are not integrated in one assembly. The shock absorbing device is a

compressible rubber, polymer or spring stop which connects with the nudge plate 12 when actuated to the limit.

Referring to the drawing in Figure 3 another alternative layout for a self operated cooling device is shown whereby the nudge device is a bar in preference to a plate. In this arrangement the livestock animal 33 nudges the bar 31 which actuates the plunger 32 by means of the pivot 30 on the lever 28 in connection with the pivot 19 on the mounting post 34. This arrangement may incorporate the shock absorbing device integrated within the valve assembly 19 or may employ separate valve and shock absorbing devices as with the diagram of the layout in Figure 2.

CLAIMS

1. A self operated cooling device particularly useful for livestock animals comprising a nudge plate for activation by an animal in connection with a valve which has a time on delay feature for spraying a misting jet of cooling liquid over the animal for a period of time after actuation.
2. A self operated cooling device for livestock as claimed in Claim 1 wherein there is provided a means for absorbing the shock load placed on the device when actuated by an animal.
3. A self operated cooling device for livestock as claimed in Claim 1 and Claim 2 wherein the period of on delay time can be changed by modifying the valve.
4. A self operated cooling device for livestock as claimed in the preceding claims wherein the device is particularly suitable for cooling pigs from 6 to 270 Kg in weight.
5. A valve substantially as described herein with reference to Figures 1-3 of the accompanying drawings.



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5

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Claims searched: 1 to 5

Examiner: Ross Cavill
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Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

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Int Cl (Ed.6): A01K 1/00,13/00

Other: Online: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	US 5063880 (BOUTHILLIER) whole doc	All
X	US 5056467 (SCHAEFER) note particularly figs 6-8	1 to 4
A	US 4987861 (LEMIRE) whole doc	All
A	US 4580529 (WILSON) whole doc	All

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